1066 Liquid Analytical Transmitter

ESSENTIAL INSTRUCTIONS

Read this page before proceeding!



Emerson designs, manufactures, and tests its Rosemount Analytical products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, using, and maintaining Rosemount Analytical products. Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- Read all instructions prior to installing, operating, and servicing the product. If this Instruction Manual is not the correct manual, telephone 1-800-854-8257 and the requested manual will be provided. Save this Instruction Manual for future reference.
- If you do not understand any of the instructions, contact your Emerson representative for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Rosemount. Unauthorized parts and procedures can affect the product's performance and place the safe operation of your process at risk. Look alike substitutions may result in fire, electrical hazards, or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

⚠ WARNING: EXPLOSION HAZARD

DO NOT OPEN WHILE CIRCUIT IS LIVE. ONLY CLEAN WITH DAMP CLOTH.

NOTICE

If a Model 475 Universal HART® Communicator is used with these transmitters, the software within the Model 475 may require modification. If a software modification is required, please contact your local Emerson Process Management Service Group or National Response Center at 1-800-654-7768.

ROSEMOUNT® Analytical

EMERSON. Process Management

QUICK START GUIDE – 1066 Liquid Analytical Transmitter

1. For mechanical installation instructions, see page 8 for panel mounting and page 9 for pipe or wall mounting.
2. Wire the sensor to the main circuit board. See page 10 for wiring instructions. Refer to the sensor instruction sheet for additional details. Make loop power connections.
3. Once connections are secured and verified, apply DC loop power to the transmitter.
4. When the transmitter is powered up for the first time, Quick Start screens appear. Quick Start operating tips are as follows:
   a. A highlighted field shows the position of the cursor.
   b. To move the cursor left or right, use the keys to the left or right of the ENTER key. To scroll up or down or to increase or decrease the value of a digit use the keys above and below the ENTER key. Use the left or right keys to move the decimal point.
   c. Press ENTER to store a setting. Press EXIT to leave without storing changes. Pressing EXIT during Quick Start returns the display to the initial start-up screen (select language).
5. Choose the desired language and press ENTER.
6. Choose measurement and press ENTER.
   a. For pH or ORP, choose preamplifier location. Select Analyzer to use the integral preamplifier in the transmitter; select Sensor/J-Box if your sensor is SMART or has an integral preamplifier or if you are using a remote preamplifier located in a junction box.
5. If applicable, choose units of measurement.
6. For contacting and toroidal conductivity, choose the sensors type and enter the numeric cell constant using the keys.
7. Choose temperature units: °C or °F.
8. After the last step, the main display appears. The outputs are assigned to default values.
9. To change output settings, to scale the 4-20mA current outputs, to change measurement-related settings from the default values, and to enable pH diagnostics, press MENU. Select Program and follow the prompts. Refer to the appropriate menu.
10. To return the transmitter to the factory default settings, choose Program under the main menu, and then scroll to Reset.
11. Please call the Rosemount Analytical Customer Support Center at 1-800-854-8257 if you need further support.

Specifications

GENERAL SPECIFICATIONS

Case: Polycarbonate. IP66 (CSA, FM), NEMA 4X (CSA)

Dimensions: Overall 155 x 155 x 131mm (6.10 x 6.10 x 5.15 in.). Cutout: 1/2 DIN 139mm x 139mm (5.45 x 5.45 in.)

Conduit openings: Six. Accepts PG13.5 or 1/2 in. conduit fittings

Display: Monochromatic graphic liquid crystal display. No backlight. 128 x 96 pixel display resolution. Active display area: 58 x 78mm (2.3 x 3.0 in.). All fields of the main instrument display can be customized to meet user requirements.

Ambient temperature and humidity: -20 to 65°C (-4 to 149°F), RH 5 to 95% (non-condensing).

Storage Temperature: -20 to 70°C (-4 to 158°F)

HART® Communications: PV, SV, TV, and 4V assignable to measurement, temperature and all live HART diagnostics.

RFI/EMI: EN-61326 CE

Complies with the following Standards:

CSA: C22.2 No 0 – 10; C22.2 No 0.4 – 04; C22.2 No. 25-M1966: , C22.2 No. 94-M91: , C22.2 No.142-M1987: , C22.2 No. 157-M1992: , C22.2 No. 213-M1987: , C22.2 No. 60529:05. UL: 50; 508; 913; 1203. ANSI/ISA: 12.12.02-2011.

ATEX: IEC 60079-0:2011, 60079-11:2011

IECEx: IEC 60079-0: 2011 Edition: 6.0, I EC 60079-11 : 2011-06 Edition: 6.0

FM: 3600: 2011, 3610: 2010, 3611: 2004, 3810: 2005, IEC 60529:2004, ANSI/ISA 60079-0: 2009, ANSI/ISA 60079-11: 2009

Hazardous Location Approvals

Intrinsic Safety (with appropriate safety barrier):

Class I, II, III, Div. 1
Groups A-G
T4 Tamb = -20°C to 65°C

IECEx BAS 11.90098X
EEx ia IIC
T4 Tamb = -20°C to 65°C

ATEX

CE 1180 II 1 G
Baseefa04ATEX0195X
EEx ia IIC
T4 Tamb = -20°C to 65°C

Class I, II & III, Division 1, Groups A-G T4
Tamb = -20°C to 40°C for -FI option
Tamb = -20°C to 65°C for -HT and -FF options

Class I, Zone 0, AEx ia IIC T4
Tamb = -20°C to 40°C for -FI option
Tamb = -20°C to 65°C for -HT and -FF options

Non-Incendive:

Class I, Div. 2, Groups A-D
Dust Ignition Proof
Class II & III, Div. 1, Groups E-G
NEMA 4/4X, IP66 Enclosure
T4 Tamb = -20°C to 65°C

Class I, Division 2 Groups A-D
Dust Ignition proof

Class II & III, Division 1, Groups E-G
IP66 enclosure
Tamb = -20°C to 40°C for -FI option
Tamb = -20°C to 65°C for -HT and –FF options

Input: One isolated sensor input. Measurement choices of pH/ORP, resistivity/conductivity/TDS, % concentration, total and free chlorine, monochloramine, dissolved oxygen, dissolved ozone, and temperature. For contacting conductivity measurements, temperature element can be a PT1000 RTD or a PT100 RTD. Other measurements (except ORP) and use PT100 or PT1000 RTDs or a 22k NTC (D.O. only).

Power & Load Requirements: Supply voltage at the transmitter terminals should be at least 12.7Vdc. Power supply voltage should cover the voltage drop on the cable plus the external load resistor required for HART communications (250 Ω minimum). Minimum power supply voltage is 12.7Vdc. Maximum power supply voltage is 42.4 Vdc (30 Vdc for intrinsically safe operation). The graph shows the supply voltage required to maintain 12 Vdc (upper line) and 30 Vdc (lower line) at the transmitter terminals when the current is 22 mA.

Analog Outputs: Two-wire loop powered (Output 1 only). Two 4-20 mA electrically isolated current outputs (Output 2 must be externally powered). Superimposed HART digital signal on Output 1. Fully scalable over the operating range of the sensor.

Weight/Shipping Weight: 2 lbs/3 lbs (1 kg/1.5 kg)

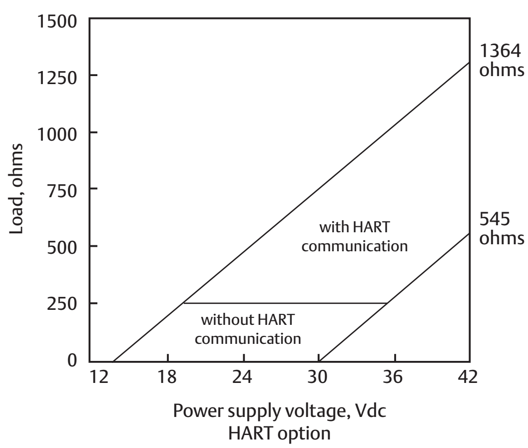


FIGURE 1. Load/Power Supply Requirements

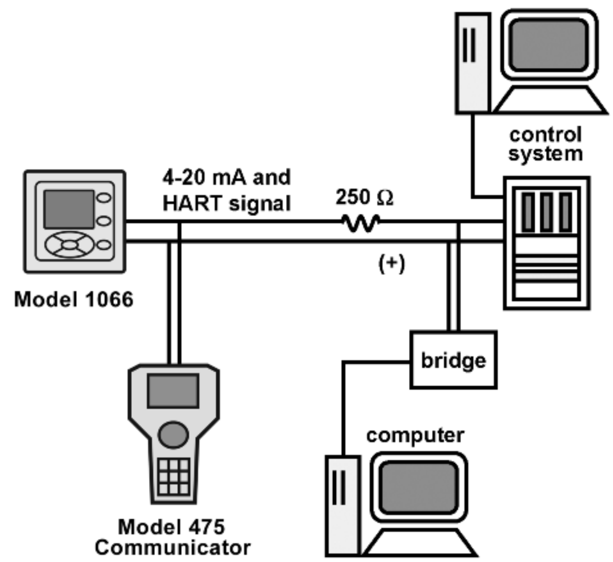


FIGURE 2. Power Supply-Current Loop Wiring

Specifications *CONTINUED*

CONTACTING CONDUCTIVITY

Performance Specifications

Measurement Range: see table below

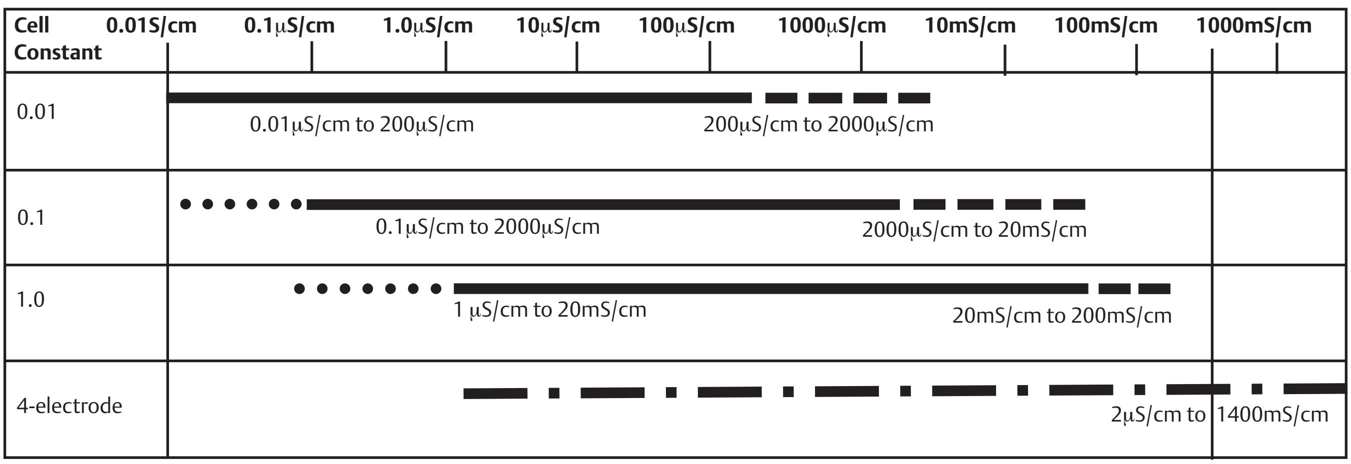
Input filter: time constant 1 - 999 sec, default 2 sec.

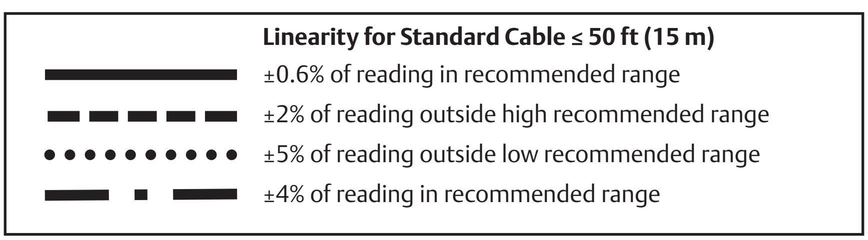
Response time: 3 seconds to 95% of final reading using the default input filter

Recommended Sensors for Conductivity

All Rosemount Analytical ENDURANCE Model 400 series conductivity sensors (Pt 1000 RTD) and Model 410VP 4-electrode sensor.

PERFORMANCE SPECIFICATIONS
Recommended Range – Contacting Conductivity





Temperature specifications:

Temperature range	0 to 200°C
Temperature Accuracy, Pt-1000, 0-50°C	± 0.1°C
Temperature Accuracy, Pt-1000, Temp. > 50°C	± 0.5°C

Specifications *CONTINUED*

TOROIDAL CONDUCTIVITY

Performance Specifications

Measurement Range: see table below

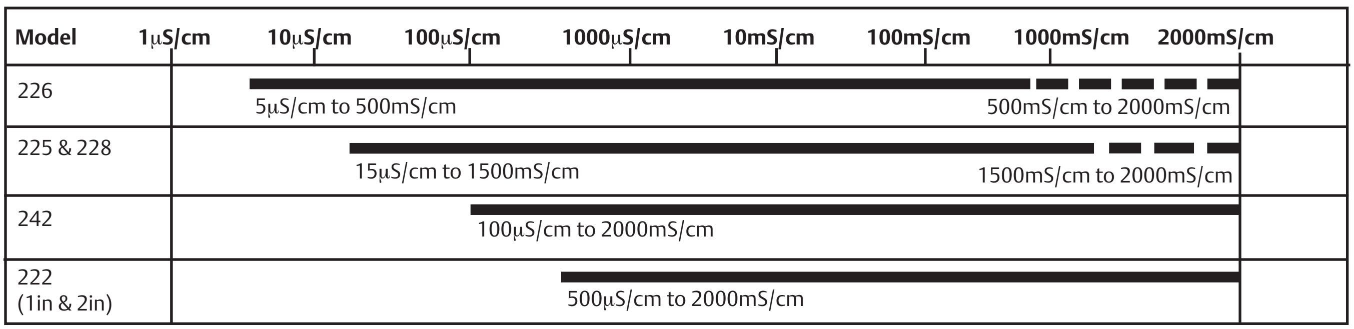
Input filter: time constant 1 - 999 sec, default 2 sec.

Response time: 3 seconds to 95% of final reading

Recommended Sensors for Conductivity

All Rosemount Analytical submersion/immersion and flow-through toroidal sensors.

PERFORMANCE SPECIFICATIONS
Recommended Range - Toroidal Conductivity



LOOP PERFORMANCE (Following Calibration)

- (solid line) Model 226: ±1% of reading ±5µS/cm in recommended range
- (solid line) Models 225 & 228: ±1% of reading ±15µS/cm in recommended range
- (solid line) Models 222, 242: ±4% of reading ±5mS/cm in recommended range
- (dashed line) Models 225, 226 & 228: ±5% of reading outside high recommended range

Temperature specifications:

Temperature range	-25 to 210°C (-13 to 410ºF)
Temperature Accuracy, Pt-100, -25 to 50 °C	± 0.5°C
Temperature Accuracy, Pt-100,. 50 to 210°C	± 1°C

Installation

UNPACKING AND INSPECTION

Inspect the shipping container. If it is damaged, contact the shipper immediately for instructions. Save the box. If there is no apparent damage, unpack the container. Be sure all items shown on the packing list are present. If items are missing, notify Rosemount Analytical immediately.

INSTALLATION

General Information

1. Although the transmitter is suitable for outdoor use, installation is direct sunlight or in areas of extreme temperatures is not recommended unless a sunshield is used.
2. Install the transmitter in an area where vibration and electromagnetic and radio frequency interference are minimized or absent.
3. Keep the transmitter and sensor wiring at least one foot from high voltage conductors. Be sure there is easy access to the transmitter.
4. The transmitter is suitable for panel, pipe, or surface mounting.
5. The transmitter case has six 1/2-inch (PG13.5) conduit openings. Use separate conduit openings for the power/output cable, the sensor cable, and the other the sensor cable as needed (pH input for free chlorine with continuous pH correction).
6. Use weathertight cable glands to keep moisture out to the transmitter. If conduit is used, plug and seal the connections at the transmitter housing to prevent moisture from getting inside the instrument.

PREPARING CONDUIT OPENINGS

There are six conduit openings in all configurations of Model 1066. (Note: four enclosure opening plugs will be provided upon shipment.)

Conduit openings accept 1/2-inch conduit fittings or PG13.5 cable glands. To keep the case watertight, block unused openings with NEMA 4X or IP66 conduit plugs.

NOTE: Use watertight fittings and hubs that comply with your requirements. Connect the conduit hub to the conduit before attaching the fitting to the transmitter.

WARNING: RISK OF ELECTRICAL SHOCK

Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other applicable national or local codes.

ELECTROSTATIC IGNITION HAZARD

Special condition for safe use (when installed in hazardous area)

1. The plastic enclosure, excepting the front panel, must only be cleaned with a damp cloth. The surface resistivity of the non-metallic enclosure materials is greater than one gigaohm. Care must be taken to avoid electrostatic charge build-up. The Model 1066 Transmitter must not be rubbed or cleaned with solvents or a dry cloth.
2. The panel mount gasket has not been tested for type of protection IP66 or Class II and III. Type of protection IP66 and Class II, III refer the enclosure only.
3. The surface resistivity of the non-metallic enclosure materials is greater than one gigaohm. Care must be taken to avoid electrostatic charge build-up. The Model 1066 Transmitter must not be rubbed or cleaned with solvents or a dry cloth.
4. Special Condition of Use of 1066-C-FF/FI-67 and 1066-T-FF/FI-67. For use with simple apparatus model series 140, 141, 142, 150, 400, 401, 402, 402VP, 403, 403VP, 404, and 410VP contacting conductivity sensors and model series 222, 225, 226, 228 toroidal sensors.

FIGURE 3. Panel Mounting Dimensions

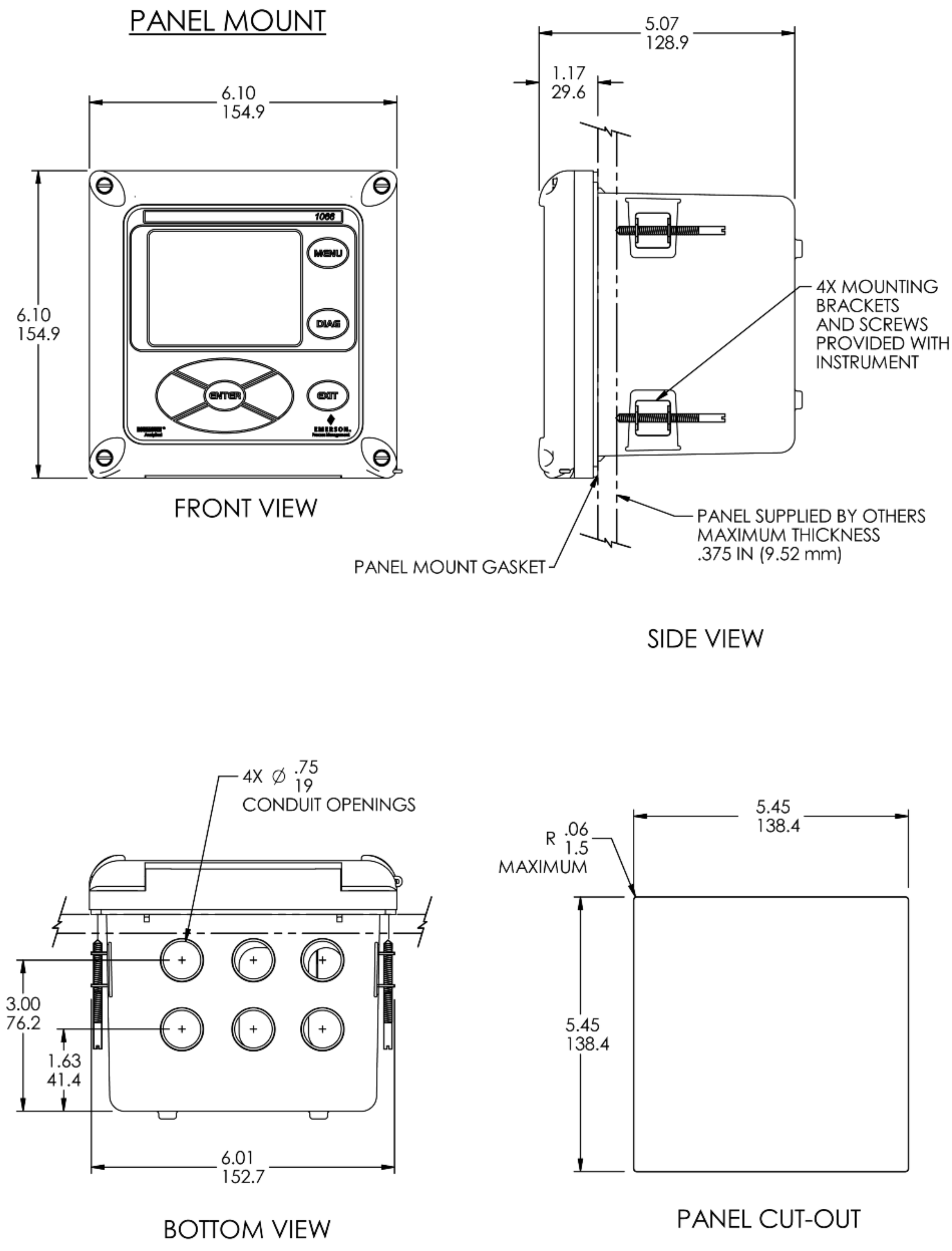


FIGURE 4. Pipe and wall mounting dimensions (Mounting bracket PN: 23820-00)

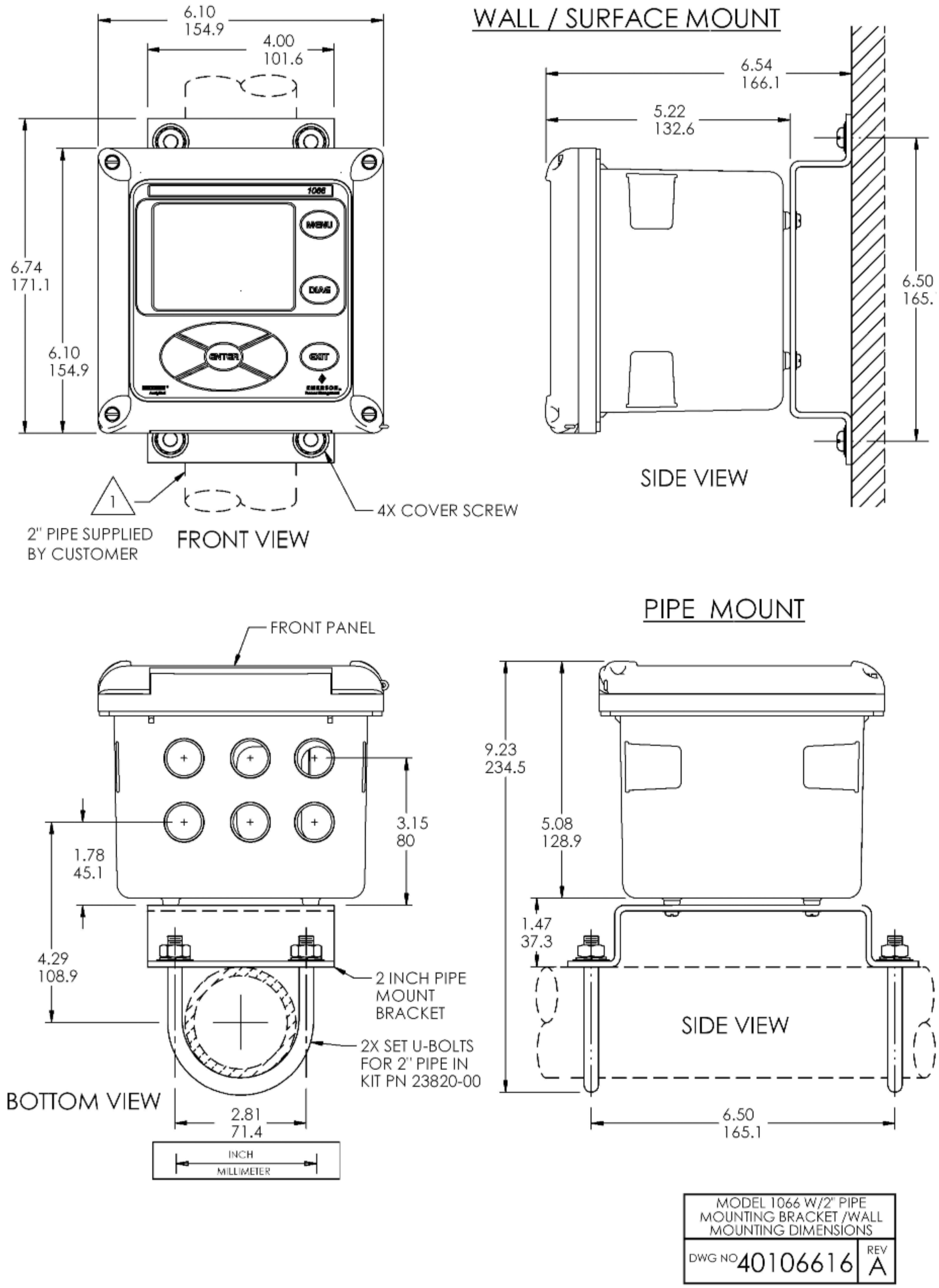


FIGURE 5. Contacting and Toroidal Conductivity sensor wiring to 1066 circuit board (1066-C and 1066-T)

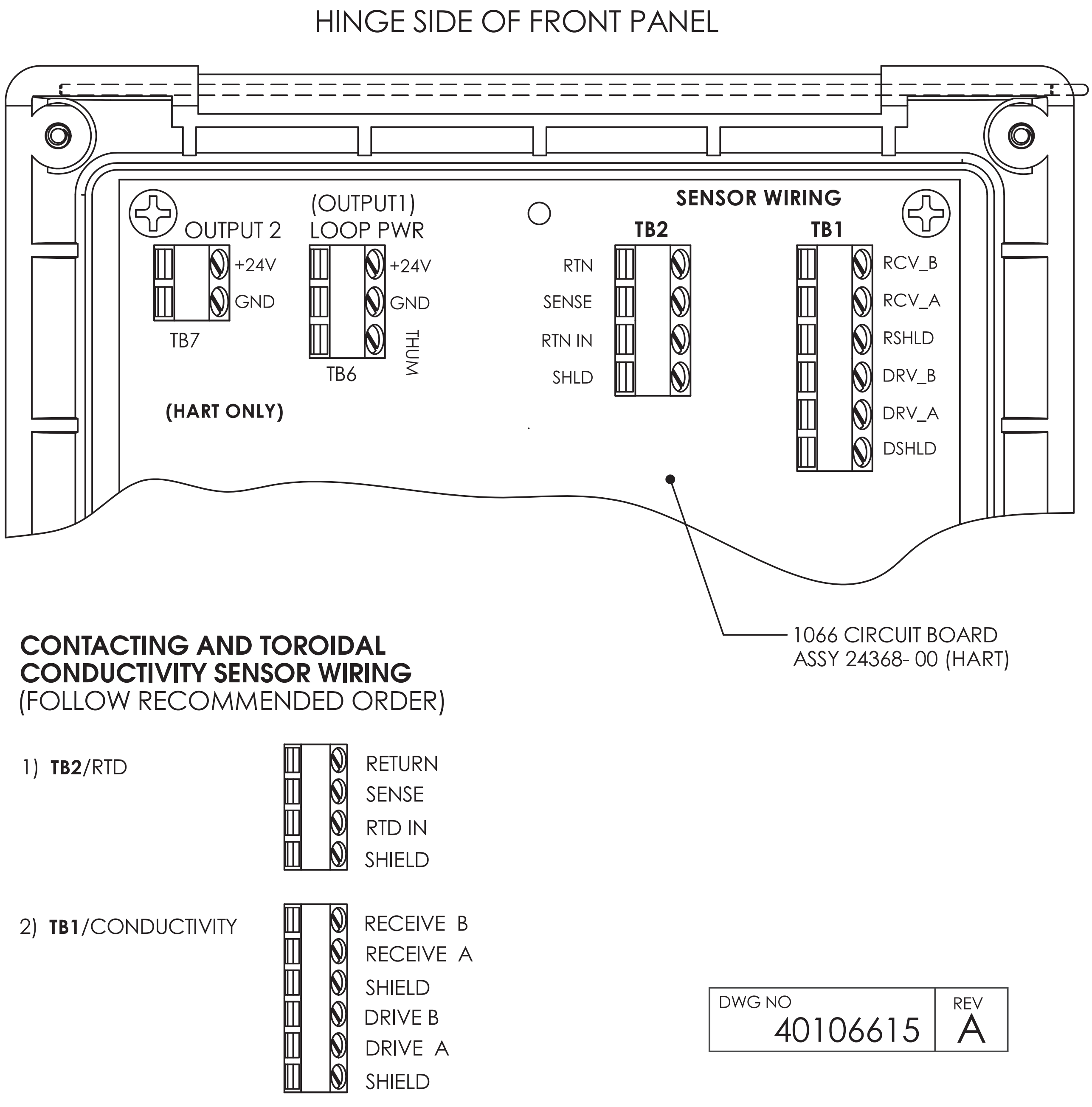


FIGURE 6. CSA Installation

APROVED MODELS
1066-AA-BB-69 XMTR

WHERE 'AA' = MEASUREMENT TYPE, EXAMPLES:
P = pH/ORP
C L = AMPEROMETRIC CHLORINE
DO = AMPEROMETRIC DISSOLVED OXYGEN
OZ = AMPEROMETRIC OZONE
C = CONTACTING CONDUCTIVITY
T = TOROIDAL CONDUCTIVITY
WHERE 'BB' = ANALOG/DIGITAL OUTPUT TYPE, EXAMPLE:
AN = 4-20 mA ANALOG CURRENT LOOP OUTPUT
HT = 4-20 mA ANALOG CURRENT LOOP OUTPUT AND HART COMMUNICATION
FF = FOUNDATION FIELDBUS DIGITAL COMMUNICATION OPTION
FI = FISCO (FIELDBUS INSTRINSICALLY SAFE CONCEPT) DIGITAL COMMUNICATION OPTION
WHERE -69 SIGNIFIES THAT THE INSTRUMENT WILL BE MARKED WITH THE CSA LOGO FOR INTRINSIC SAFETY APPROVAL.

18. NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING SENSORS TO THE INSTRUMENT. ATTACHED SENSORS MUST BE CSA APPROVED AS NON-INCENDIVE FOR CLASS 1, DIVISION 2, GROUPS ABCD WITH ENTITY INPUT REQUIREMENTS LESS THAN THOSE LISTED IN TABLES I AND II OR BE CLASSIFIED AS "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2 V, 0.1 A, 25 mW OR 20 µJ (pH, AMPEROMETRIC SENSORS WITHOUT PREAMPS AND CONTACTING CONDUCTIVITY SENSORS QUALIFY AS SIMPLE APPARATUS).

17. INSTALLATION TO BE IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE.

16. DIVISION 2 WIRING METHOD.

15. 1066 MUST NOT BE CONNECTED TO EQUIPMENT GENERTING MORE THAN 250 VAC.

14. 1066 MODELS WITH P/CL/DO/OZ OPTIONS INCLUDE INTEGRAL PREAMPLIFIER CIRCUITRY. AN EXTERNAL PREAMPLIFIER MAY ALSO BE USED. THE OUTPUT PARAMETERS SPECIFIED IN TABLE II ARE VALID FOR EITHER PREAMPLIFIER. PREAMPLIFIERS MEETING THESE OUTPUT PARAMETERS INCLUDE ROSEMOUNT 23546-00, 23538-00, 23561-00 AND 1700702 PREAMPLIFIER ASSEMBLIES. A WEATHER RESISTANT ENCLOSURE MUST HOUSE THE TYPE 23546-00 REMOTE PREAMPLIFIER.

13. CONTACTING CONDUCTIVITY SENSORS, AMPEROMETRIC AND pH SENSORS WITHOUT PREAMPS SHALL MEET THE REQUIREMENTS OF SIMPLE APPARATUS AS DEFINED IN ANSI/ISA RP12.6 AND THE NEC, ANSI/NFPA 70. THEY CAN NOT GENERATE NOR STORE MORE THAN 1.5 V, 100 mA, 25 mW OR A PASSIVE COMPONENT THAT DOES NOT DISSIPATE MORE THAN 1.3W.

12. THE MODEL 1066T HAS SYSTEM APPROVAL FOR USE WITH MODELS 222, 225, 226, 228, 242 AND 245 TOROIDAL SENSORS. 1066 MODELS WITH P/CL/DO/OZ/C OPTIONS HAVE OUTPUT ENTITY PARAMETERS WHICH ALLOW THE USE OF VARIOUS SENSORS; SO LONG AS THE CAPACITANCE AND INDUCTANCE OF THE LOAD CONNECTED TO THE SENSOR TERMINALS DO NOT EXCEED THE VALUES SPECIFIED IN TABLE I WHERE:
Ca ≥ Ci (SENSOR) + Ccable; La ≥ Li (SENSOR) + Lcable.

11. ANY SINGLE SHUNT ZENER DIODE SAFETY BARRIER APPROVED BY CSA HAVING THE FOLLOWING OUTPUT PARAMETERS:
<u>SUPPLY/SIGNAL TERMINALS TB6-1 AND 2 FOR FIELDBUS OPTION OR TB6-1, 2 AND 3 FOR HART AND -AN-OPTIONS. ALSO TB7-1 AND 2 IF ANALOG OUTPUT 2 IS USED.</u>
Voc OR Vt ≤ 30 V FOR 1066-AA-HT/AN/FF-69.
Isc OR It ≤ 200 mA FOR 1066-AA-HT/AN-69; ≤ 300 mA FOR 1066-AA-FF-69.
Pmax ≤ 0.9 W FOR 1066-AA-HT/AN-69; ≤ 1.3 W FOR 1066-AA-FF-69.

10. THE INTRINSICALLY SAFE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE DEVICES WITH ASSOCIATED APPARATUS WHEN THE FOLLOWING IS TRUE:

FIELD DEVICE INPUT		ASSOCIATED APPARATUS OUTPUT
Vmax OR Ui	≥	Voc, Vt OR Uo
Imax OR Ii	≥	Isc, It OR Io
Pmax OR Pi	≥	Po
Ci + Ccable	≤	Ca, Ct OR Co
Li + Lcable	≤	La, Lt OR Lo

9. INTRINSICALLY SAFE APPARATUS (MODEL 1066, SMART THUM WIRELESS ADAPTER, MODEL 375, 475) AND ASSOCIATED APPARATUS (SAFETY BARRIER) SHALL MEET THE FOLLOWING REQUIREMENTS: THE VOLTAGE (Vmax) AND CURRENT (Imax) OF THE INTRINSICALLY SAFE APPARATUS MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc OR Vt) AND CURRENT (Isc OR It) WHICH CAN BE DEVELOPED BY THE ASSOCIATED APPARATUS (SAFETY BARRIER). IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) OF THE INTRINSICALLY SAFE APPARATUS, INCLUDING INTERCONNECTING WIRING, MUST BE EQUAL OR LESS THAN THE CAPACITANCE (Ca) AND INDUCTANCE (La) WHICH CAN BE SAFELY CONNECTED TO THE APPARATUS. (REF. TABLES I, II AND III).

8. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.

7. CONTROL EQUIPMENT CONNECTED TO ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc.

6. INSTALLATION SHOULD BE IN ACCORDANCE WITH ANSI/ISA RP12.06.01 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS" AND THE CANADIAN ELECTRICAL CODE, CSA C22.1, PART 1, APPENDIX F.

5. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN CLASS II AND CLASS III ENVIRONMENTS.

4. METAL CONDUIT IS NOT REQUIRED IN INTRINSICALLY SAFE INSTALLATIONS. HOWEVER, IF CONDUIT IS USED, BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

3. RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN 1.0 Ohm.

2. THE ASSOCIATED APPARATUS MUST BE CSA APPROVED.

1. NO REVISION TO DRAWING WITHOUT PRIOR CSA APPROVAL.

NOTES: UNLESS OTHERWISE SPECIFIED

TABLES IA AND IIA ARE FOR pH, CHLORINE, DISOLVED OXYGEN AND OZONE OPTIONS

TABLE IA (FOR 1066-P/CL/DO/OZ)

GAS GROUPS	OUTPUT PARAMETERS Ca (µF)	La (mH)
A, B	1.5	0.280
C	9.9	1.1
D	39	2.2

TABLE IIA (FOR 1066-P/CL/DO/OZ)

OUTPUT PARAMETERS	MODEL 1066 TB1-1 THRU 12
Uo	11.76 V
Io	353 mA
Po	420 mW

TABLES IB AND IIB ARE FOR CONTACTING CONDUCTIVITY

TABLE IB (FOR 1066-C)

GAS GROUPS	OUTPUT PARAMETERS Ca (µF)	La (mH)
A, B	1.5	0.28
C	9.9	1.1
D	42	2.2

TABLE IIB (FOR 1066-C)

OUTPUT PARAMETERS	MODEL 1066 TB1-1 THRU 12
Uo	5.88 V
Io	505 mA
Po	214 mW

TABLE III

1066 SUPPLY ENTITY PARAMETERS

MODEL NO.	Vmax (VDC)	Imax (mA)	Pmax (W)	Ci (nF)	Li (mH)
1066-AA-HT/AN-69 LOOP POWER SIGNAL TERMINALS TB6 -1, -2 & -3	30	200	0.9	0	0
1066-AA-HT/AN-69 ANALOG OUTPUT 2 SIGNAL TERMINALS TB7 -1 & -2	30	200	0.9	0	0
1066-AA-FF-69 LOOP POWER SIGNAL TERMINALS TB6 -1 & -2	30	300	1.3	0	0
1066-AA-FI-69 LOOP POWER SIGNAL TERMINALS TB6 -1 & -2	17.5	380	5.32	0	0

ENTITY PARAMETERS: REMOTE TRANSMITTER INTERFACE

MODEL NO.	Vmax IN: Vdc	Imax IN:mA	Pamx IN: W	Ci (µF)	Li (mH)	Voc max OUT: Vdc	Isc max OUT:uA
375 OR 475	30	200	1.0	0.0	0.0	1.9	32

(475 INSTALLATION DRAWING IS 00475-1130)

RELEASE DATE	ECO NO	REV	SCHEMATIC, INSTALLATION MODEL 1066 XMTR, (CSA)
JUL 13, 2011	LQD10467	B	DWG NO 1400669 REV C

FIGURE 7. CSA Installation

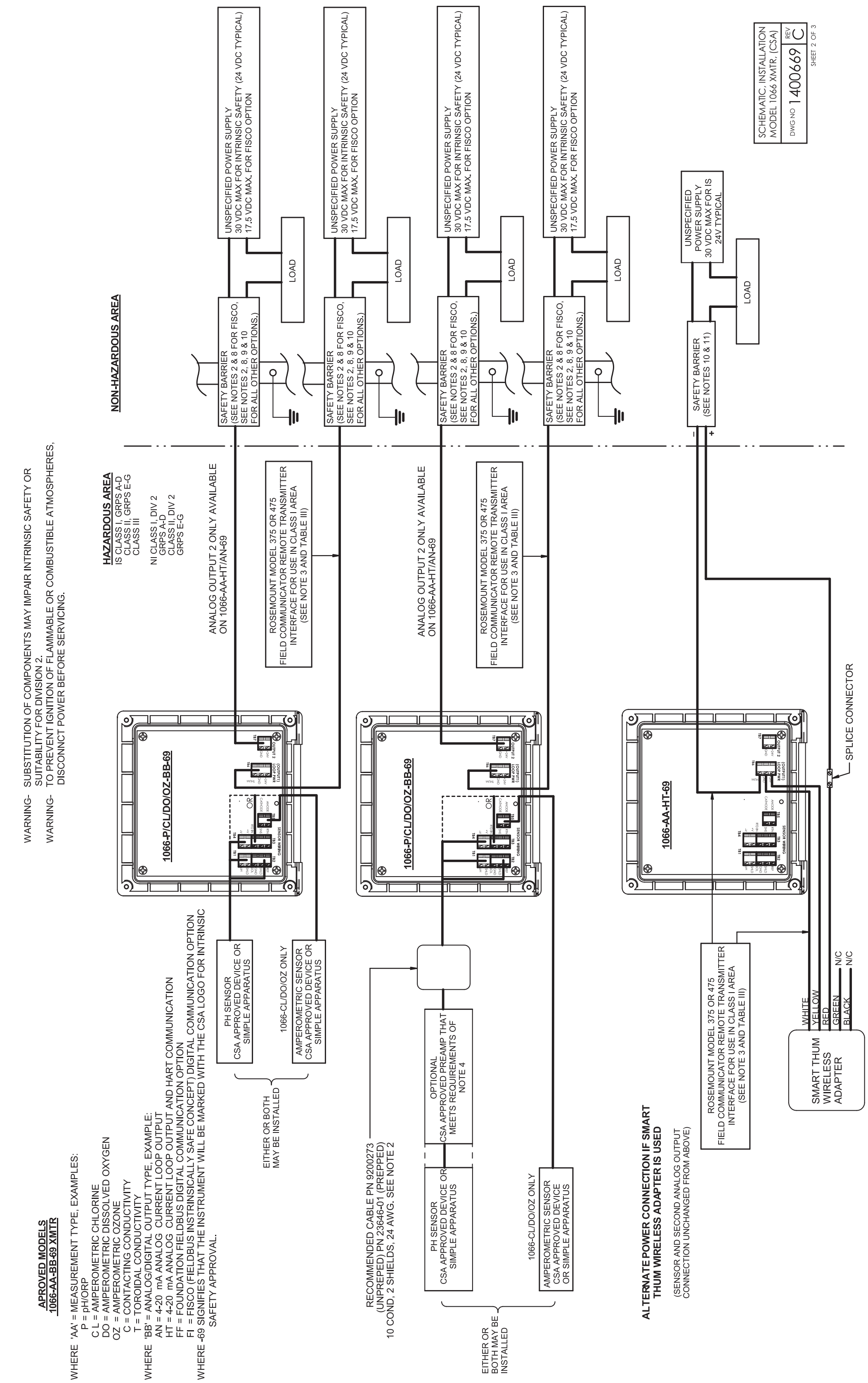


FIGURE 8. CSA Installation

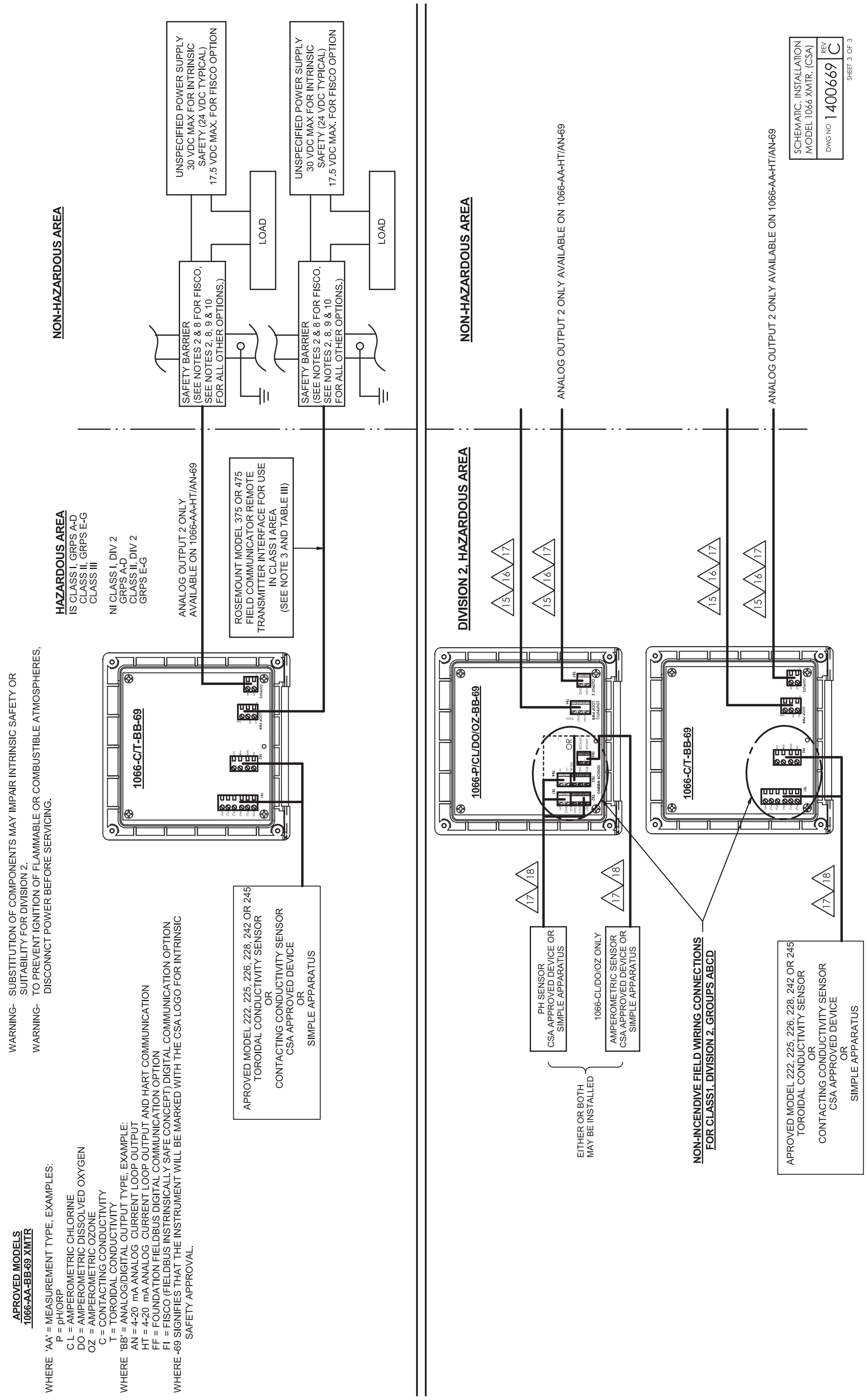


FIGURE 9. CSA Label Information

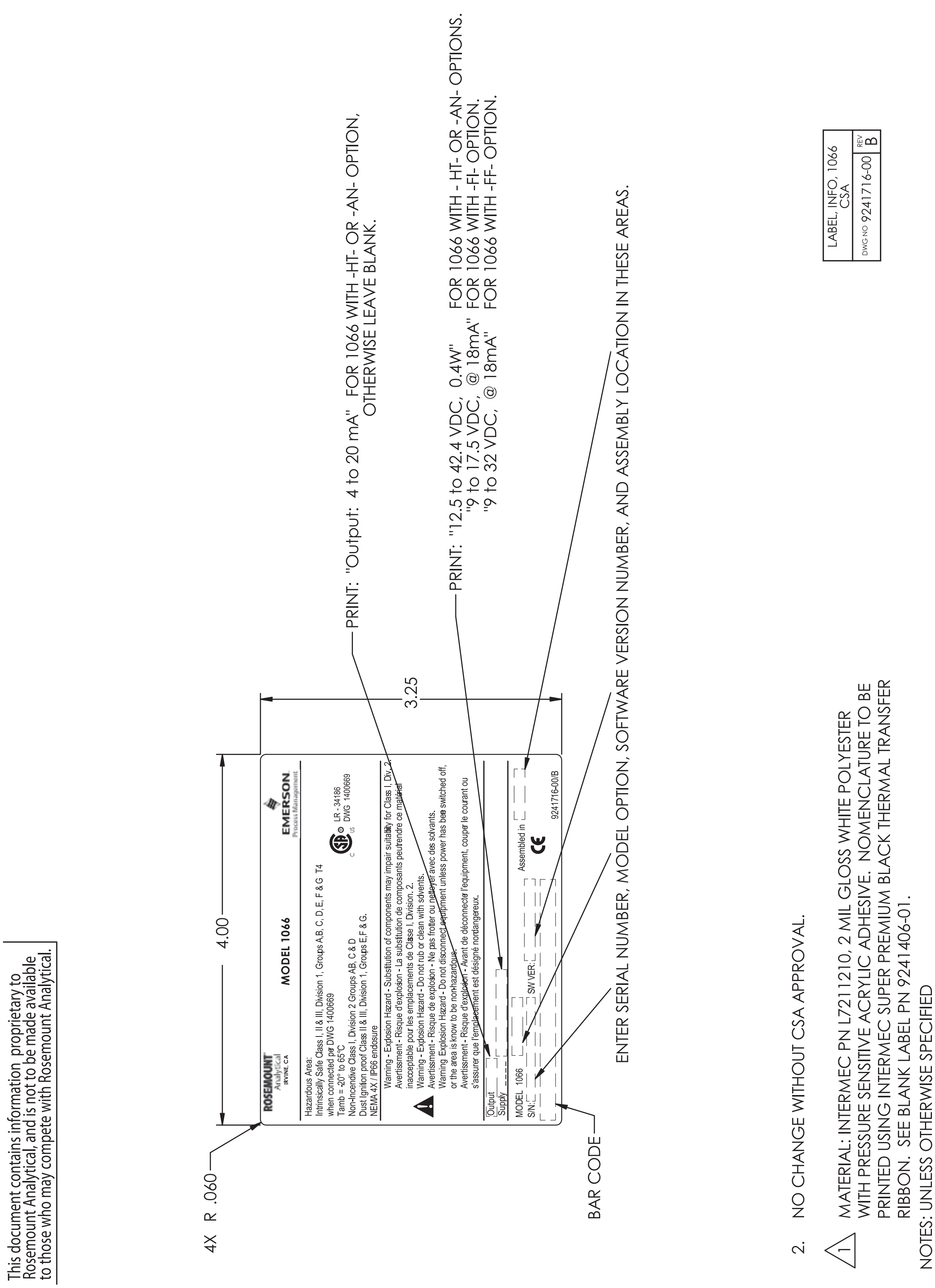


FIGURE 10. ATEX, IECEx Label Information

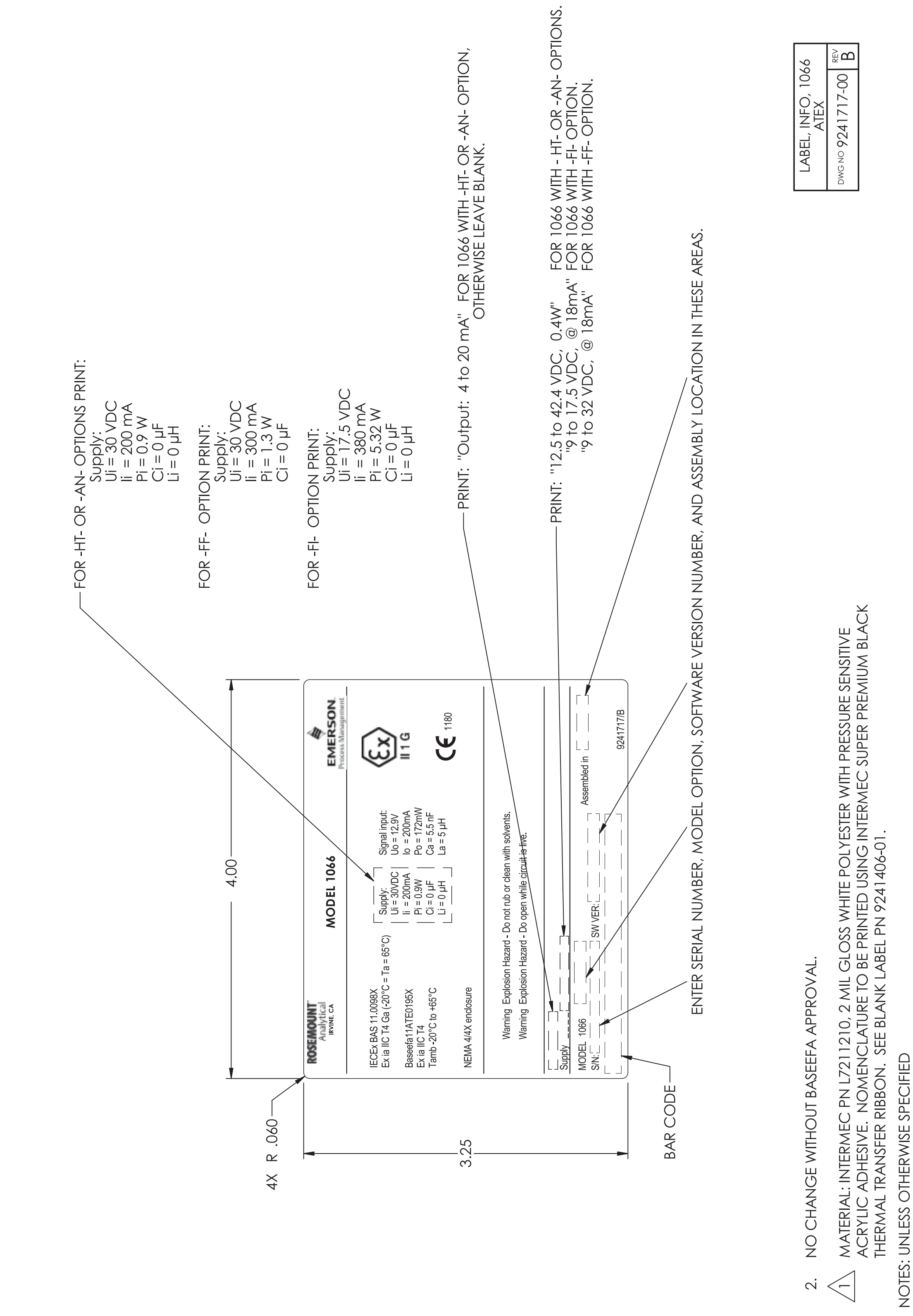


FIGURE 11. FM installation

THIS DOCUMENT IS CERTIFIED BY
FM REV A
REV
REV
REV
REV
REV
REVISIONS NOT PERMITTED W/O AGENCY APPROVAL

APROVED MODELS 1066-AA-BB-67 XMTR

WHERE 'AA' = MEASUREMENT TYPE:
P = pH/ORP
C L = AMPEROMETRIC CHLORINE
DO = AMPEROMETRIC DISSOLVED OXYGEN
OZ = AMPEROMETRIC OZONE
C = CONTACTING CONDUCTIVITY
T = TOROIDAL CONDUCTIVITY
WHERE 'BB' = ANALOG/DIGITAL OUTPUT TYPE:
AN = 4-20 mA ANALOG CURRENT LOOP OUTPUT
HT = 4-20 mA ANALOG CURRENT LOOP OUTPUT AND HART COMMUNICATION
FF = FOUNDATION FIELDBUS DIGITAL COMMUNICATION OPTION
FI = FISCO (FIELDBUS INSTRINSICALLY SAFE CONCEPT) DIGITAL COMMUNICATION OPTION
WHERE -67 SIGNIFIES THAT THE INSTRUMENT WILL BE MARKED WITH THE FM LOGO FOR INTRINSIC SAFETY APPROVAL.

19 A 1066 WITH THE -FI OPTION MAY BE INSTALLED PER THE FISCO INSTRUCTIONS OR PER THE INTRINSICALLY SAFE INSTRUCTIONS ON THIS DRAWING.

18 IF USING MODEL 375 OR 475 COMMUNICATOR, OR MODEL 775 THUM WIRELESS ADATER, MANUFACTURE'S INSTALLATION DRAWING MUST BE FOLLOWED.

17 INSTALLATION TO BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

16 NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING SENSORS TO THE INSTRUMENT. ATTACHED SENSORS MUST BE FM APPROVED AS NON-INCENDIVE FOR CLASS 1, DIVISION 2, GROUPS ABCD WITH ENTITY INPUT VALUES OF Vmax AND Imax ≥ Voc (Vt) AND Isc (It) LISTED IN TABLE IIA/IIB AND THE Ci AND Li OF THE SENSOR AND INTERCONNECTED WIRING MUST BE ≤ THE VALUES OF Ca AND La LISTED IN TABLES IA/IB OR BE CLASSIFIED AS "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2 V, 0.1 A, 25 mW OR 20 μJ (pH OR AMPEROMETRIC SENSORS WITHOUT PREAMPS AND CONTACTING CONDUCTIVITY SENSORS QUALIFY AS SIMPLE APPARATUS).

15 DIVISION 2 WIRING METHOD PER THE NEC (EXCLUDING NONINCENDIVE FIELD WIRING).

14. METAL CONDUIT IS NOT REQUIRED FOR INTRINSICALLY SAFE INSTALLATIONS. HOWEVER, IF CONDUIT IS USED, BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

13. NO REVISION TO DRAWING WITHOUT PRIOR FM APPROVAL.

12. THE ASSOCIATED APPARATUS MUST BE FM APPROVED AND MUST BE RESISTIVELY LIMITED HAVING LINEAR OUTPUTS.

11. CONTROL EQUIPMENT CONNECTED TO ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc.

10. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.

9. THE INTRINSICALLY SAFE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE DEVICES WITH ASSOCIATED APPARATUS WHEN THE FOLLOWING IS TRUE:

FIELD DEVICE INPUT		ASSOCIATED APPARATUS OUTPUT
Vmax OR Ui	≥	Voc, Vt OR Uo
Imax OR Ii	≥	Isc, It OR Io
Pmax OR Pi	≥	Po
Ci + Ccable	≤	Ca, Ct OR Co
Li + Lcable	≤	La, Lt OR Lo

8. RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN 1.0 Ohm.

7. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN CLASS II AND CLASS III ENVIRONMENTS.

6. CONTACTING CONDUCTIVITY SENSORS, AMPEROMETRIC AND pH SENSORS WITHOUT PREAMPS SHALL MEET THE REQUIREMENTS OF SIMPLE APPARATUS AS DEFINED IN ANSI/ISA RP12.6 AND THE NEC, ANSI/NFPA 70. THEY CAN NOT GENERATE NOR STORE MORE THAN 1.5 V, 100 mA, 25 mW OR A PASSIVE COMPONENT THAT DOES NOT DISSIPATE MORE THAN 1.3W.

5. INSTALLATION SHOULD BE IN ACCORDANCE WITH ANSI/ISA RP12.06.01 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS CLASSIFIED) LOCATIONS" AND THE NATIONAL ELECTRICAL CODE, (ANSI/NFPA 70) SECTIONS 504 AND 505.

4. WHEN CONNECTIONS ARE MADE TO 1066-AA-HT/AN-67 OPTION ANALOG OUTPUT 2 (TB7-1 & -2), SEPARATE WIRING AND A SECOND BARRIER ARE REQUIRED. THE WIRING FROM EACH BARRIER MUST BE INSTALLED AS SEPARATE INTRINSICALLY SAFE CIRCUITS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

3. INTRINSICALLY SAFE APPARATUS (MODEL 1066, SMART THUM WIRELESS ADAPTER, MODEL 375, 475) AND ASSOCIATED APPARATUS (SAFETY BARRIER) SHALL MEET THE FOLLOWING REQUIREMENTS: THE VOLTAGE (Vmax) AND CURRENT (Imax) OF THE INTRINSICALLY SAFE APPARATUS MUST BE EQUAL TO OR GREATER THAN THE VOLTAGE (Voc OR Vt) AND CURRENT (Isc OR It) WHICH CAN BE DEVELOPED BY THE ASSOCIATED APPARATUS (SAFETY BARRIER). IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) OF THE INTRINSICALLY SAFE APPARATUS, INCLUDING INTERCONNECTING WIRING, MUST BE EQUAL OR LESS THAN THE CAPACITANCE (Ca) AND INDUCTANCE (La) WHICH CAN BE SAFELY CONNECTED TO THE APPARATUS. (REF. TABLES I, II AND III).

2. THE MODEL 1066-C/T HAS SYSTEM APPROVAL FOR USE WITH MODELS 222, 225, 226 & 228 TOROIDAL SENSORS OR 140, 141, 142, 150, 400, 401, 402, 402VP, 403, 403VP, 404& 410VP CONTACTING CONDUCTIVITY SENSOR. CABLE LENGTH FOR CONDUCTIVITY SENSORS MUST BE LESS THAN 200'.
1066 MODELS WITH P/CL/DO/OZ/C OPTIONS HAVE OUTPUT ENTITY PARAMETERS WHICH ALLOW THE USE OF VARIOUS SENSORS WHICH MAY BE SIMPLE APPARATUS OR HAVE FM APPROVED ENITY PARAMETERS; SO LONG AS THE CAPACITANCE AND INDUCTANCE OF THE LOAD CONNECTED TO THE SENSOR TERMINALS DO NOT EXCEED THE VALUES SPECIFIED IN TABLE I WHERE:
Ca > Ci (SENSOR) + Ccable; La > Li (SENSOR) + Lcable.

1. ANY SINGLE SHUNT ZENER DIODE SAFETY BARRIER APPROVED BY FM HAVING THE FOLLOWING OUTPUT PARAMETERS: SUPPLY/SIGNAL TERMINALS TB6-1 AND 2 FOR FIELDBUS OPTION OR TB6-1, 2 AND 3 FOR HART AND -AN-OPTIONS. ALSO TB7-1 AND 2 IF ANALOG OUTPUT 2 IS USED.
Voc OR Vt < 30 V FOR 1066-'AA'-HT/AN/FF-67; ≤ 17.5 Vdc FOR 1066-'AA'-FI-67.
Isc OR It < 200 mA FOR 1066-'AA'-HT/AN-67; < 300 mA FOR 1066-'AA'-FF-67; ≤ 380mA FOR 1066-'AA'-FI-67.
Pmax < 0.9 W FOR 1066-'A'A-HT/AN-67; < 1.3 W FOR 1066-'AA'-FF-67; ≤ 5.32W FOR 1066-'AA'-FI-67.

REVISION

LTR	ECO	DESCRIPTION	BY	DATE	CHECKED/APPROVED
B	LQD10696	SEE ECO	CH	8-9-12	JP / DOC

TABLE I (FOR 1066-P/CL/DO/OZ)

GAS GROUPS	OUTPUT PARAMETERS	
	Ca (μF)	La (mH)
II C	1.70	5.16
II B	11.6	20.7
II A	47.9	41.41

TABLE II (FOR 1066-PLCL/DO/OZ)

OUTPUT PARAMETERS	MODEL 1066 TB1 - 1 THRU 12
Uo (Vt)	11.328 V
Io (It)	82.86 mA
Po (Pt)	117.33 mW

TABLE III

1066 ENTITY PARAMETERS SUPPLY					
MODEL NO.	Vmax (Vdc)	Imax (mA)	Pmax (W)	Ci (nF)	Li (μH)
1066-'AA'-**HT/AN**-67 LOOP POWER SIGNAL TERMINALS TB6 - 1, -2 AND -3	30	200	0.9	0	8.95
1066-'AA'-**HT/AN**-67 ANALOG OUTPUT 2 SIGNAL TERMINALS TB6 - 1AND -2	30	200	0.9	0	5.97
1066-'AA'-**FF**-67 LOOP POWER SIGNAL TERMINALS TB6 - 1AND -2	30	300	1.3	0	0
1066-'AA'-**FI**-67 LOOP POWER SIGNAL TERMINALS TB6 - 1AND -2	17.5	300	5.32	0	0

ENTITY PARAMETERS: REMOTE TRANSMITTER INTERFACE							
MODEL NO.	Vmax IN	Imax IN	Pamx IN	Ci (μF)	Li (mH)	Voc max OUT	Isc max OUT
375 OR 475	30 Vdc	200 mA	1.0 W	0.0	0.0	1.9 Vdc	32 μA

(475 INSTALLATION DRAWING IS 00475-1130)

20. THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (Ui OR Vmax), THE CURRENT (Ii OR Imax) AND THE POWER (Pi OR Pmax) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (Uo,Voc OR Vt), THE CURRENT (10, Isc OR It) AND THE POWER (Po OR Pmax) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND THE INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5nF and 10 uH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE Uo (OR Voc OR Vt) OF THE ASSOCIATED APPARATUS IS LIMITED TO ARANGE OF 14 VTO 24 Vdc ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50uA FOR EACH CONNECTED DEVCE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:
Loop Resistance R: 15....... 150 Ohm/km
Inductance per unit length L: 0.4.......1 mH/km
Capacitance per unit length C: 80.........200 nF
C =Cline/line + 0.5C line/screen, if both lines are floating, or
C= Cline/line + C line/screen, if the screen is connected to one line
Length of trunk cable: less than or equal to 1000m
Length of spur cable: less than or equal to 30m
Length of spur splice: less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:
R=90.....100 Ohm C=0.....2.2 uF

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED DUE TO I.S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO ATOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITED. THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

FEB 14, 2012	LQD10595	A	SCHEMATIC, INSTALLATION MODEL 1066 XMTR, (FM)	
RELEASE DATE	ECO NO	REV	DWG NO 1400670	REV B

FIGURE 12. FM Installation

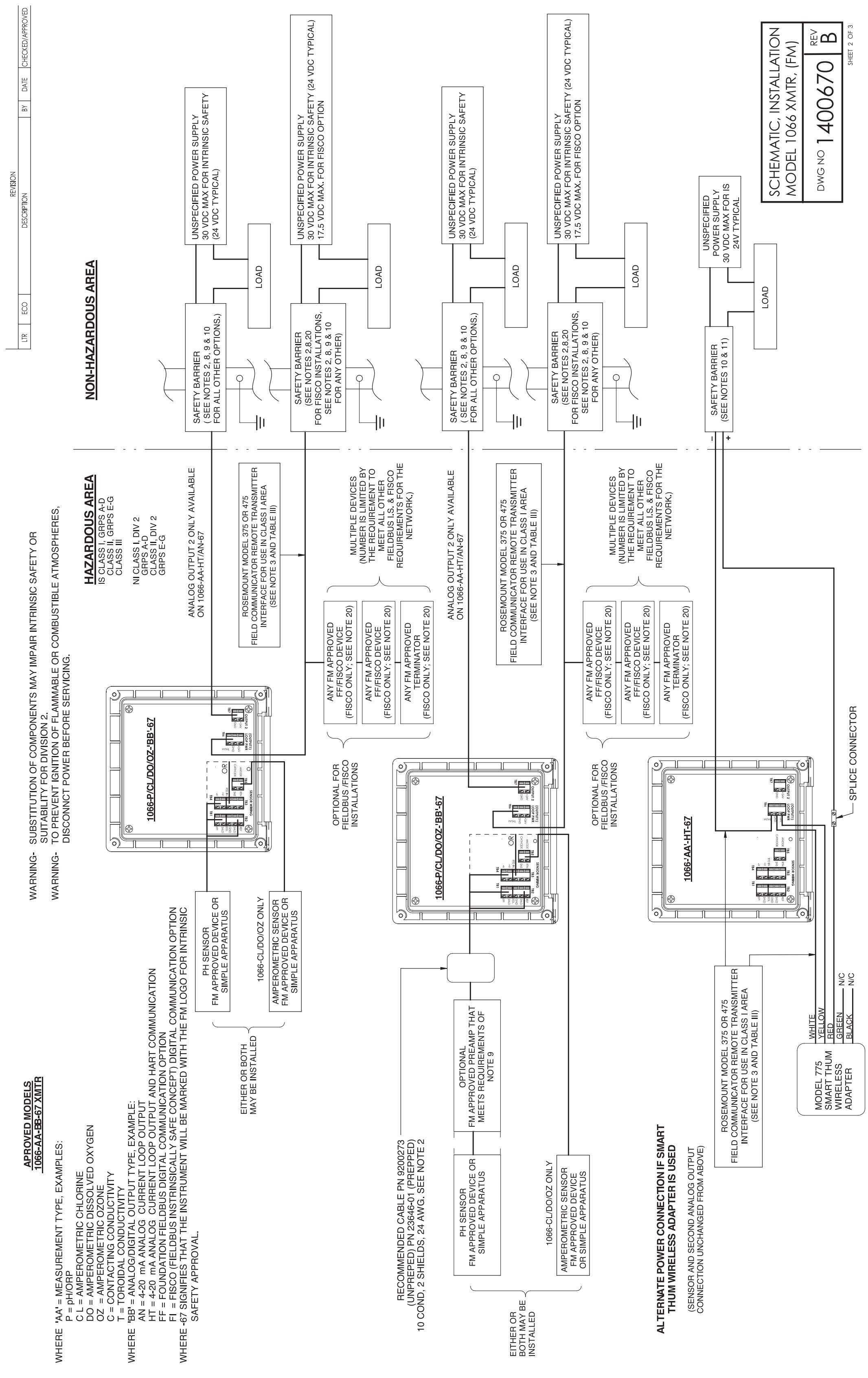


FIGURE 13. FM installation

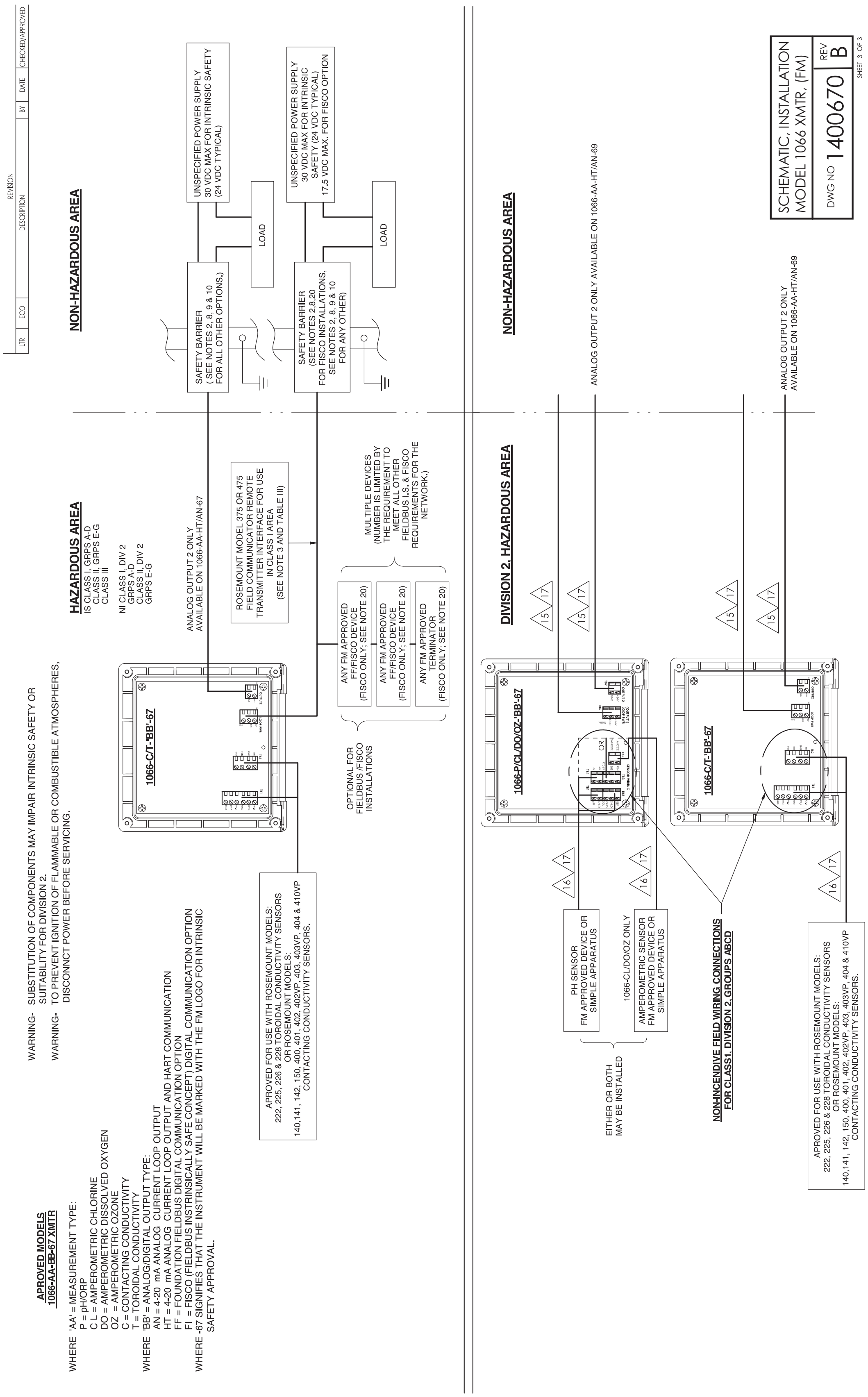
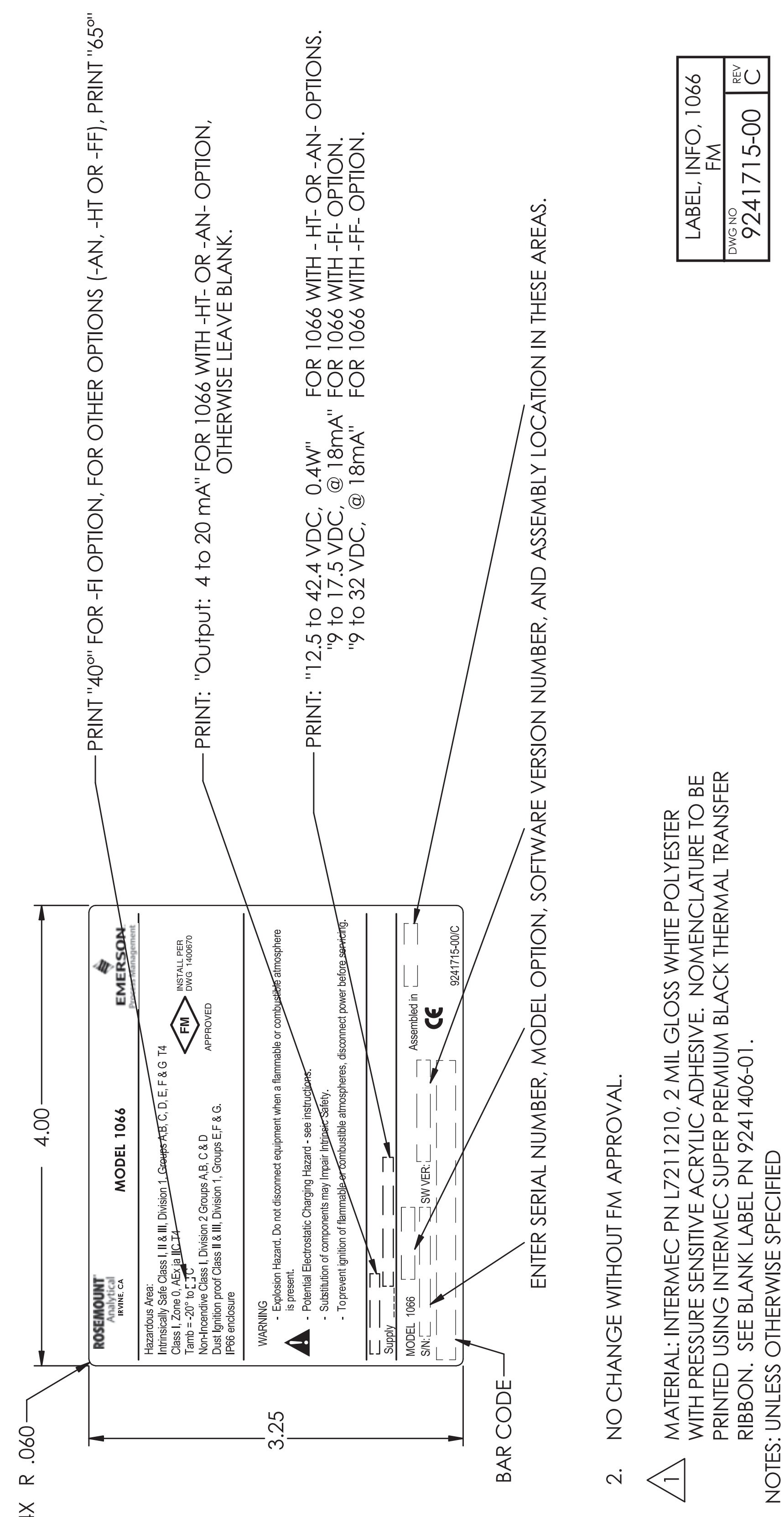


FIGURE 14. FM label information



ROSEMOUNT Analytical

EC Declaration of Conformity

We, Emerson Process Management, Blegistrasse 21, Baar, Switzerland CH 6341
declare under our sole responsibility that the product,

Model 1066-AA-BB-CC Smart-enabled, 2-wire Transmitter;

Where AA is:
C (Contacting Conductivity measurement)
T (Toroidal Conductivity measurement)

Where BB is:
HT (Analog/HART communication)
FF (Fieldbus communication)
FI (FISCO communication)

Where CC is:
60 (Not labeled for agency)

manufactured by, Emerson Process Management, Rosemount Analytical Inc.,
2400 Barranca Parkway, Irvine California 92606 USA
to which this declaration relates, is in conformity with the provisions of the European Community Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Community notified body certification, as shown in the schedule.

(signature) Andy Kemish (name printed)

Vice President Analytical Europe (function name)

March 13, 2012 (date of issue)

Schedule

EMC Directive (2004/108/EC)
Harmonized standard used: EN 61326-1: 2006

CE marking was first affixed to this product in 2012

EMERSON. Process Management

ROSEMOUNT Analytical

EC Declaration of Conformity

We, Emerson Process Management, Blegistrasse 21, Barr, Switzerland CH 6341
declare under our sole responsibility that the product,

Model 1066-AA-BB-CC Smart-enabled, 2-wire Transmitter;

Where AA is:
C (Contacting Conductivity measurement)
T (Toroidal Conductivity measurement)

Where BB is:
HT (Analog/HART communication)
FF (Fieldbus communication)
FI (FISCO communication)

Where CC is:
73 (Labeled for Atex/IECEx)

manufactured by, Emerson Process Management, Rosemount Analytical Inc.,
2400 Barranca Parkway, Irvine California 92606 USA
to which this declaration relates, is in conformity with the provisions of the European Community Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Community notified body certification, as shown in the schedule.

(signature) Andy Kemish (name printed)

Vice President Analytical Europe (function name)

November 17, 2011 (date of issue)

Schedule

EMC Directive (2004/108/EC)
Harmonized standard used: EN 61326-1: 2006

ATEX Directive (94/9/EC)
Provisions of the directive fulfilled by the equipment:
Equipment Group II, Category 1 G (Ex ia IIC T4)

Intrinsically Safe Certificate: Baseefa11ATEX0195X
Special Condition for safe use:
The plastic enclosure, excluding the front panel, may constitute a potential electrostatic ignition risk and must only be cleaned with a damp cloth.

Harmonized standards used: 60079-0:2011 60079-11:2011

ATEX Notified Body for EC Type Examination Certificate & Quality Assurance:
Baseefa [Notified Body Number: 1180], Rockhead Business Park, Staden Lane Buxton, Derbyshire SK17 9RZ, United Kingdom

CE marking was first affixed to this product in 2011

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Credit Cards for U.S. Purchases Only.

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